

## WHAT IS CLAIMED IS:

## 1. A lamp comprising:

an illuminant section having an illuminant for  
5 irradiating a light, whose size is determined by an arc length  
and a direction of the arc length is equal to a direction of  
an optical axis of the lamp;

a lamp reflector whose parabolic focus is equal to a  
center point of the illuminant in the illuminant section, for  
10 reflecting, as a parallel light flux to the optical axis, a  
light flux irradiated from the center point of the illuminant  
section by the paraboloid of revolution around the optical  
axis toward a forward direction of the optical axis; and

a lamp front glass having a plate-shaped incident plane  
15 and a plate-shaped outgoing plane, for receiving the parallel  
light flux from the lamp reflector through the incident plane  
and outputting the parallel light flux through the outgoing  
plane,

wherein the paraboloid of revolution of the lamp  
20 reflector is formed by a deformation of a aspherical  
reflection surface which is in symmetry of rotation to the  
optical axis, and

at least one of the incident plane and the outgoing plane  
of the lamp front glass is formed by a deformation of an  
25 aspherical lens surface which is in symmetry of rotation to  
the optical axis, and

the light flux is collimated to the parallel light flux  
traveling from the illuminant toward its irradiation direction  
by applying corresponding power which is different in light  
30 flux in order to control a distribution of a divergent angle

at the outgoing plane of the lamp front glass.

2. The lamp according to claim 1, wherein a circular area where there is no outgoing light around the optical axis on the outgoing plane of the lamp front glass, which being generated when the light irradiated by the illuminant is reflected by the paraboloid of revolution is reduced by the reflection of the aspheric reflection surface and a lens function of the aspheric lens surface.

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3. The lamp according to claim 1, wherein the flux of the outgoing light is output through the outgoing surface of the lamp front glass so that the divergent angle of the outgoing light flux at an optional point on the outgoing plane becomes constant.

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4. A polarizing conversion optical system comprising:  
the lamp according to claim 1;

a lens array comprising a plurality of lenses arranged in array for condensing outgoing lights from the lamp; and

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a polarization conversion element comprising a plurality of polarizing beam splitters arranged in array placed near a lens focus of the lens array, for outputting the flux of the outgoing lights output from the lamp front glass after orthogonal polarized components included in the outgoing lights are coincided to each other.

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5. A condensing optical system comprising:

the lamp according to claim 1;

a condenser lens group for condensing outgoing lights

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from the lamp into a lens focus; and

a rod integrator for receiving its incident plane condensed at the lens focus and outputting the flux of the lights through its outgoing surface after repeated operations  
5 of a total reflection at a side surface of the rod integrator.

6. An image display device comprising:

the polarization converting optical system according to claim 4;

10 an optical modulation element for receiving incident lights from the polarization converting optical system, giving them image information, and outputting light flux with the image information;

an integrator optical system for overlapping and  
15 outputting the light flux from the polarization converting optical system to the incident surface of the photo modulation element;

a projecting optical system for projecting the light flux with the image information transmitted from the photo  
20 modulation element; and

a screen for receiving the light flux projected by the projecting optical system, and displaying the image based on the light flux with the image information.

25 7. An image display device

the condensing optical system according to claim 5;

a relay optical system for relaying lights from the condensing optical system;

an optical modulation element for giving image  
30 information the lights relayed by the relay optical system,

and for outputting the lights with the image information;

a projecting optical system for projecting the lights with the image information from the optical modulation element; and

5 a screen for receiving the lights projected by the projecting optical system, and for displaying the image based on the image information.